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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/732,200	12/07/2000	Volker Rasche	PHD 99,179	9483

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BRIARCLIFF MANOR, NY 10510

EXAMINER	
KAO, CHIH CHENG G	
ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/732,200	RASCHE ET AL.	
	Examiner	Art Unit	
	Chih-Cheng Glen Kao	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2004 and 09 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-19 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-19 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1 and 13 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following suggestions may obviate their respective objections: (claim 1, line 13, "the plane"; replacing "the" with - -a- -), (claim 13, line 11, "and_wherein"; deleting the underscore) and (claim 13, lines 12-13, "such that the imaging scale"; replacing "the" with - -an- -).

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-3, 5-19, and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 1, 13, and 18 in particular, the subject matter that is not described in the specification is the supporting device comprising a plurality of hinged, serially interconnected supporting members connected by six hinges, each of the hinges enabling rotation about an axis of rotation so that the supporting device has six separate axes of rotation, wherein the hinges connected the supporting members are plane hinges.

The only reference to hinges enabling rotation about an axis of rotation so that the supporting device has six separate axes of rotation is on Page 5, lines 5-9, of the specification. As noted in Figures 4a and 4b, there are six hinges that enable rotation about an axis of rotation, so that the supporting device in this embodiment has six axes. However, all of these six hinges are not plane hinges. As noted in Figure 3, #14, plane hinges are hinges that enable the holding device to be changed in the plane defined by the supporting arms (Page 4, lines 19-20, of the specification). According to this definition, "G2", "G4", and "G5" in Figures 4A and 4B are the only plane hinges in the supporting device. Furthermore, in Figures 2 and 3, there are only 3 plane hinges in the supporting device. Based on the drawings and specification, there is no description of a supporting device with six plane hinges. Thus, the specification does not describe in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of a supporting device comprising a plurality of hinged, serially interconnected supporting members connected by six hinges, each of the hinges enabling rotation about an axis of rotation so that the supporting

device has six separate axes of rotation, wherein the hinges connected the supporting members are plane hinges.

Furthermore with regards to claim 1 in particular, additional subject matter that is not described in the specification is the supporting device comprising a plurality of hinged, serially interconnected supporting members connected by six hinges and wherein the second end is connected to a rotational hinge. As seen in Figures 4a and 4b, there are only six hinges total. There is no additional rotational hinge at the second end of the supporting device. Figures 2 and 3 show a rotational hinge at the second end; however, there are only 3 hinges on the supporting device. Thus, the specification does not describe in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of a supporting device comprising a plurality of hinged, serially interconnected supporting members connected by six hinges and wherein the second end is connected to a rotational hinge.

3. Claims 1, 2, 8, 13, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding claims 1, 13, and 18, the phrase "may" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

5. Regarding claims 2 and 8, the phrase "notably" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 7, 11, and 17-19, are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause (US Patent 5901200) in view of Jarin et al. (FR 2645007).

7. Regarding claims 1 and 18, Krause discloses an x-ray device (Fig. 2) with a source (Fig. 2, #2) and detector (Fig. 1, #3) mounted at different ends of a common holding device (Fig. 2, #4) being connectable to a room by way of a supporting device (Fig. 2, #16-18), such that the supporting device has a first end connected to the common holding device (Fig. 2, end connected to #4) and a second end connectable to the room (Fig. 2, ceiling), wherein the supporting device comprising serially inter-connected supporting members (Fig. 2, #16-18) with a plane hinge (Fig. 2, hinge between #16 and 17), and wherein the second end is connected to a rotational hinge (Fig. 2, hinge connecting #16 and ceiling) such that the entire supporting device is rotatable about an axis parallel to the plane defined by the supporting members (Fig. 2, rotation about "B" when #16 and 17 are parallel).

However, Krause does not seem to specifically disclose six hinges so that the supporting device has six separate axes of rotation with members individually controlled.

Jarin et al. teaches six hinges so that the supporting device has six separate axes of rotation (Fig. 1, #22, 19, 9, 22', 19', 13, and 10) with supporting members individually controlled (Fig. 1 and Abstract).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the device of Krause with hinges and individually controlled members of Jarin et al., since one would be motivated to incorporate these to better coordinate all movements during an examination (Abstract) as implied from Jarin et al.

8. Regarding claim 2, Krause further discloses the supporting device as a serial manipulator (Fig. 2, #16-18).

9. Regarding claim 3, Krause further discloses the supporting device constructed and connected in such a manner that the common holding device can be positioned completely as desired (Fig. 2).

10. Regarding claim 7, Krause further discloses a c-arm (Fig. 2).

11. Regarding claim 11, Krause further discloses the distance between the source and detector as invariable (Fig. 2, #2 and 3).

12. Regarding claim 17, Krause further discloses the source and detector mounted on the common holding device by a displacement device such that the source and detector can be displaced along an axis (Fig. 2, #4 and "β").

13. Regarding claim 19, Krause further discloses wherein the second end is connected to the room at a connection point such that the rotational hinge permits rotation about an axis extending perpendicularly out from the connection point (Fig. 2, "B").

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krause in view of Jarin et al. as applied to claim 1 above, and further in view of Hollstein (US Patent 3281598).

Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose a hinge connected to the holding device permitting 360 degree rotation about an axis.

Hollstein teaches a hinge connected to the holding device permitting 360 degree rotation about an axis (Fig. 3 and col. 3, lines 21-32).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested device of Krause as modified above with the rotating hinge of Hollstein, since one would be motivated to direct x-rays to all directions (col. 3, lines 25-26) as shown by Hollstein in order to obtain an x-ray image from any direction.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krause in view of Jarin et al. as applied to claim 1 above, and further in view of Holmström (US Patent 3,784,837).

Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose a holding device composed of at least two holding members for the source and detector.

Holmström discloses a holding device composed of at least two holding members for the source and detector (Fig. 1).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested device of Krause as modified above with the holding device of Holmström, since one would be motivated to have separate holding members to move the x-ray source and detector as freely as possible around the patient as shown by Holmström (col. 1, lines 6-8) and to keep the x-ray source and detector independently controlled for proper alignment (col. 2, lines 1-9) to send x-rays and obtain a signal.

16. Claim 8, 10, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause in view of Jarin et al. as applied to claim 1 above, and further in view of Travanty et al. (US Patent 4,987,583).

17. Regarding claims 8, 10, and 15, Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose means for monitoring distance between an object and the x-ray device with mechanical contact sensors producing a signal.

Travanty et al. teaches means for monitoring distance between an object and the x-ray device (abstract, lines 2-4, and col. 3, lines 50-66) with mechanical contact sensors producing a signal (col. 3, lines 35-40 and 63-66).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested device of Krause as modified above with the monitoring means of Travanty et al., since one would be motivated to incorporate this to protect the examined object or patient from being severely hurt by contact with the source or detector as shown by Travanty et al. (col. 1, lines 38-42, and col. 2, lines 11-14).

18. Regarding claim 14, Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose braking when the distance between the moving parts and the object falls below a safety threshold.

Travanty et al. teaches braking when the distance between the moving parts and the object falls below a safety threshold (col. 2, lines 11-14).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further modify the suggested device of Krause as modified above with braking of Travanty et al., since one would be motivated to incorporate this to protect the examined object or patient from being severely hurt by contact with the source or detector as shown by Travanty et al. (col. 1, lines 38-42, and col. 2, lines 11-14).

19. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krause in view of Jarin et al. and Travanty et al. as applied to claim 8 above, and further in view of Hinton et al. (US Patent 5485502).

Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose ultrasound monitoring of the object and x-ray device.

Hinton et al. teaches an ultrasound monitoring of the object and x-ray device (Abstract, lines 1-3, col. 1, lines 48-53, and col. 12, lines 53-58).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested device of Krause as modified above with ultrasonic monitoring of Hinton et al., since one would be motivated to use the monitoring to avoid collision between the various elements of the system as shown by Hinton et al. (col. 2, lines 10-15, and col. 12, lines 47-53) in order to increase safety.

20. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krause in view of Jarin et al. as applied to claim 2 above, and further in view of Hinton et al.

Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose software control of the c-arm.

Hinton et al. teaches software control of the c-arm (col. 5, lines 14-19).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested device of Krause as modified above with the software control of Hinton et al., since one would be motivated to use a computer and software

to provide better control of the motion of a c-arm so as to follow an efficient path between two positions and to avoid collision between the various elements of that system as shown by Hinton et al. (col. 2, lines 10-15) in order to save time and increase safety.

21. Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krause in view of Jarin et al., Holmström, and Schaefer et al. (US Patent 5410584).

22. Regarding claim 13 and for purposes of being concise, Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose that the distance between the source and detector can change by moving the first and second holding members such that the imaging scale and the size of examination are variable.

Jarin et al. further discloses the distance between the source and detector changing by moving the first and second holding members such that the imaging size of examination is variable (Figs. 3-6). Schaefer et al. teaches the distance change such that the imaging scale is variable (col. 1, lines 65-68).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further modify the suggested device of Krause as modified above with the changing distance for varying the imaging size of Jarin et al., since one would be motivated to incorporate such a change based on the area of interest during examination as implied from Jarin et al. (Figs. 3-6).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested device of Krause as modified above with the changing distance of Schaefer et al., since one would be motivated to incorporate such a change to vary the imaging scale (col. 1, lines 65-68) as shown by Schaefer et al.

23. Regarding claim 21, Krause as modified above suggests a device as recited above.

However, Krause does not disclose a third holding member connected to the supporting device along with the first and second holding members.

Holmström further teaches a third holding member connected to the supporting device along with the first and second holding members.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further modify the suggested device of Krause as modified above with a third holding member of Holmström, since one would be motivated to use this for better holding the source and detector (Fig. 1) as shown by Holmström.

24. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krause in view of Jarin et al. and Travanty et al. as applied to claim 8 above, and further in view of Ninomiya et al. (JP 11-285492).

Krause as modified above suggests a device as recited above.

However, Krause does not seem to specifically disclose a separate video system to monitor the motion of the c-arm.

Ninomiya et al. teaches a separate video system to monitor the motion of the c-arm (Abstract, Problem to be Solved).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested device of Krause as modified above with the separate video system of Ninomiya et al., since one would be motivated to keep track of the movement safely and reliably when they are operated (Abstract, Problem to be Solved) as shown by Ninomiya et al.

Response to Arguments

25. Applicant's arguments with respect to claims 1-3, 5-19, and 21 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments filed June 9, 2004, have also been fully considered but they are not persuasive.

Applicant argues that none of the art of record discloses a support device for an X-ray holder having six hinges, each enabling rotation thereabout. The Examiner disagrees. Referring to Jarin et al., Jarin et al. teaches a support device for an X-ray holder having six hinges (Fig. 1, #22, 22', 19, 19', 9, and 13), each enabling rotation thereabout. The claim further recites that these rotations are separate axes of rotation. As seen in Jarin et al., each one of these six axes in Figure 1 has it own separate axes of rotation. Thus, the supporting device has six separate axes of rotation. Although some of these axes may be considered parallel to each other, they are still separate and distinct axes of rotation. Therefore, the art of record does disclose or suggest a support device for an X-ray holder having six hinges, each enabling rotation thereabout so that the supporting device has six separate axes of rotation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gk

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER